Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2013/2014

COURSE NAME	:	ADVANCED MICROCONTROLLER
COURSE CODE	:	BEC41103
PROGRAMME	:	BEJ
EXAMINATION DATE	:	JUNE 2014
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

Q1 (a) Sketch the process of Working Register and Literal Value being fed to PIC18 ALU.
(6 marks)

(b) Explain the important of bits PIC18 Status Register.
(6 marks)

(c) Write a PIC18 program to bring in a byte of data serially one bit at a time via the RB0 pin. Place the byte on Port D. The LSB should come in first.
(7 marks)

(d) Write a PIC18 program based on equation to put a data at specific RAM address. The equation is Z = A + C / B.
(6 marks)

Q2 (a) Write a PIC18 code to create a square wave of 50% duty cycle on the RB5 pin. Timer0 is used to generate the time delay.
(6 marks)

(b) Write a PIC18 code to find the longest time delay using Timer2. Assume that XTAL =10MHz.
(6 marks)

(c) Write a PIC18 program to transfer the message "UTHM" serially at 9600 baud with 8 bit data and 1 stop bit.
(5 marks)

(d) Write a PIC18 program to send the two massages "MH370" and "Beijing" to the serial port. Assuming that SW is connected to RB0 and XTAL =10MHz. Monitor the SW status and set the baud rate as follows:

SW = 0 9600 baud rate
SW = 1 38400 baud rate

(8 marks)

Q3 (a) State the basic process of PIC18 interrupt programming in C using C18 compiler.
(4 marks)

(b) Identify six (6) instruction set based on PIC18 program in Figure **Q3(b)**.
(6 marks)

(c) Write a PIC18 program to read the keypad in Figure **Q3(c)** and sends the result to the serial port. Assuming the serial port is set for 9600 baud, 8bit mode and 1 stop bit.
(15 marks)

Q4 (a) Describe the step in writing to PIC18 flash memory.

(5 marks)

(b) Write a PIC18 code to send a message "UTHM" to flash memory starting at location 400H.

(4 marks)

(c) Write a PIC18 program based on Figure **Q4(c)** to monitor the status of SW. If SW=0, the DC motor moves with 50% duty cycle pulse and if SW=1, the DC motor moves with 25% duty cycle pulse.

(8 marks)

(d) Write a PIC18 program based on Figure **Q4(d)** to monitor the status of SW. If SW=0, the DC motor moves with 75% duty cycle pulse and if SW=1, the DC motor moves with 50% duty cycle pulse.

(8 marks)

-END OF QUESTION-

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```
//Programmed by DBT9006
//Clock: 20MHz (HS)
//Using TMR1 & TMR2 interrupt to generate wave

void interruptA(){
    PORTC.F0 = ~PORTC.F0; //Toggle RC0
    _____ (1)
    TMR1H = 0xEC; //Reload Timer
    TMR1L = 0x78;
}

void interruptB(){
    PORTC.F0 = ~PORTC.F0; //Toggle RC0
    TMR1H = 0xEC; //Reload Timer
    _____(2)
    TMR1L = 0x78;
}


void main(void){
    TRISC = 0; //Set PORTC for output
    _____(3)
    _____(4)

    PORTC = 0;
    _____(5)
    _____(6)

 while (1);
}
```

FIGURE Q3(b)

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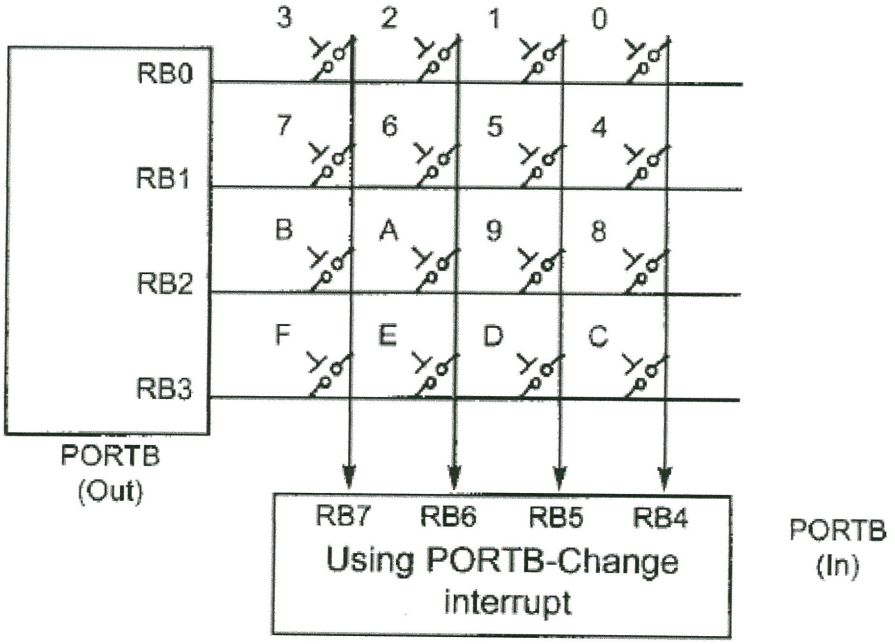

FIGURE Q3(c)

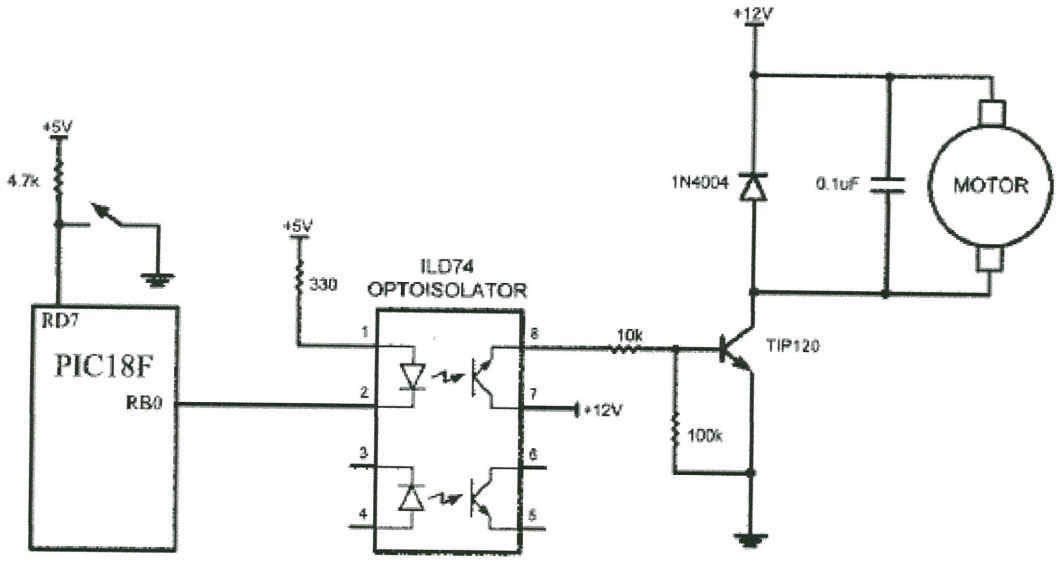

FIGURE Q4(c)

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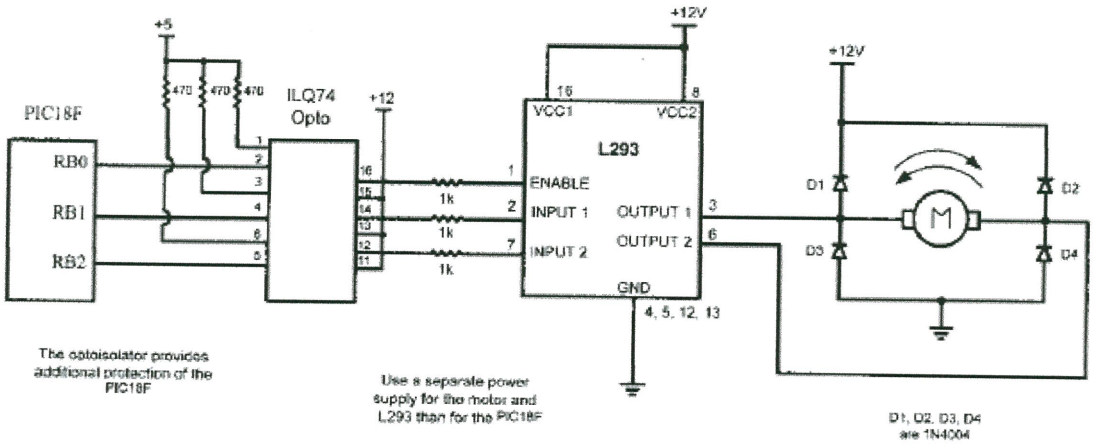

FIGURE Q4(d)